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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/759,925

01/16/2004

Kiyoshi Satoh

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8224

20995

7590

07/10/2006

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EXAMINER

KORNAKOV, MICHAEL

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 07/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/759,925	<b>Applicant(s)</b> SATO ET AL.	
	<b>Examiner</b> Michael Komakov	<b>Art Unit</b> 1746	

**– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 April 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 11 and 40-43 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 11 and 40-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>02/27/06</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/24/2006 has been entered.
2. Claims 1, 11, 40-43 are examined on the merits.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1, 11, 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subrahmanyam et al (U.S. 6,079,424) in view of Fong et al (U.S. 5,812,403) and in further view of SubSmith et al (U.S. 6,150,628).

Subrahmanyam teaches a method of cleaning a CVD chamber comprising establishing a flow of cleaning gas (NF<sub>3</sub>) through the remote plasma module and the CVD chamber after conducting a CVD reaction and prior to supplying activated plasma species into the CVD chamber; dissociating a cleaning gas within the remote plasma module 300 to produce activated plasma species; flowing activated plasma species from the remote plasma module through manifold 380 to the CVD chamber, wherein the flow of plasma species through the manifold 380 is not restricted; removing silicon nitride deposits adhered to the inside surfaces of CVD chamber (Fig.2; col.6, lines 40-

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57; col.7, lines 1-8, 38-40; paragraph bridging col.7 and 8; col.8, lines 19-29). The flow rate of NF<sub>3</sub> corresponds to the instantly claimed range.

While providing a flow of cleaning gas (NF<sub>3</sub>) through the CVD chamber prior to supplying activated plasma species into the CVD chamber, Subrahmanyam remains silent about a valve, which controls such supply of cleaning gas into the CVD chamber after conducting a CVD reaction and prior to supplying activated plasma cleaning species.

Fong teaches cleaning CVD chamber with remotely formed plasma, wherein a valve 280 between the cleaning line and the deposition chamber is utilized in order to prevent penetration of particles into the cleaning line and reduce the dead volume of the cleaning line during the deposition process (Fig. 6A; col.37, lines 41-45). The valve of Fong is opened during the entire cleaning process. Therefore, one skilled in the art, motivated by Fong would have found obvious to utilize the valve in order to prevent deposition of residues inside the cleaning manifold of Subrahmanyam and maintain full opening of the manifold, as set up in the teaching of Subrahmanyam for chamber cleaning, by completely withdrawing the valve plug from the manifold internal pass in order to maintain the same full and non-restricted flow of the cleaning gas during the CVD chamber cleaning in the method of Subrahmanyam.

Regarding claim 11, Fong teaches closing the gate valve after cleaning (paragraph bridging col. 56 and 57; col.57).

While recognizing the use of material resistant to etching by plasma radicals, created within the remote module, the teaching of Subrahmanyam/Fong does not

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specifically name the anodized aluminum. However, the use of anodize aluminum for the protection of plasma chamber surfaces is known in the art. Thus, Smith teaches remote plasma cleaning of CVD chamber, utilizing fluorine containing plasma species. Smith indicates the use of anodized aluminum as a material resistant to etching by plasma radicals within the remote plasma source (Abstract, col.2, lines 33-36,46-50; col.8, lines 56-61).

Therefore, since both Subrahmanyam/Fong and Smith indicate the use of fluorine containing plasma species, since Subrahmanyam/Fong and Smith are concerned with materials for the remote plasma chamber and Smith provides for the use of anodized aluminum, one skilled in the art motivated by Smith would have found obvious to utilize anodized aluminum as the material for remote module in order to maintain resistance of the remote module to fluorine containing plasma species in the teaching of Subrahmanyam/Fong with the reasonable expectation of success.

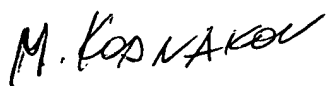
With regard to energy frequency, as per the instant claim 42, it is noted here that this parameter is result effective since it affects formation of plasma species and the output of the cleaning process. Discovery of optimum value of result effective variable is within the skills of the ordinarily skilled in the art and would have been obvious.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00am - 5:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Michael Kornakov  
Primary Examiner  
Art Unit 1746

07/05/2006